

**THIS OPINION WAS NOT WRITTEN FOR PUBLICATION**

The opinion in support of the decision being entered today  
(1) was not written for publication in a law journal and  
(2) is not binding precedent of the Board.

**Paper No. 16**

**UNITED STATES PATENT AND TRADEMARK OFFICE**

---

**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

---

**Ex parte TEDDY M. KELLER  
and DAVID Y. SON**

---

**Appeal No. 1997-3763  
Application 08/540,148**

---

**ON BRIEF**

---

**Before KIMLIN, WALTZ, and LIEBERMAN, Administrative Patent Judges.**

**LIEBERMAN, Administrative Patent Judge.**

## DECISION ON APPEAL

**This is an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 1 through 20 which are all the claims remaining in the application.<sup>1</sup>**

## THE INVENTION

**The invention is directed to a boron-carbon-silicon ceramic prepared by pyrolyzing an organo-boron thermoset polymer having a specified structure at a sufficient temperature and time to yield the claimed material.**

## THE CLAIM

**Claim 1 is illustrative of appellants' invention and is reproduced below.<sup>2</sup>**

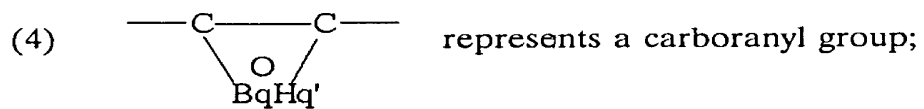
**1. A boron-carbon-silicon ceramic made by a method comprising the step of:**  
**pyrolyzing at a temperature and for a time an organoboron thermoset polymer having a repeating unit of formula (I):**

---

<sup>1</sup>  
Claims 21 through 25 stand withdrawn from consideration as directed to a non-elected invention. See 37 CFR § 1.142(b).

<sup>2</sup>  
Claim 1 was apparently canceled by clerical error and not by direction of appellants. Accordingly, we consider original claim 1.





(5) q and q' are integers from 3 to 16;

(6) x and x' represent integers between 0 to 2000;

(7) wherein E and A may be the same or different;

ridge and mixtures thereof; and

(8) E is selected from the group consisting of O, an aliphatic ridge, an aryl ridge and mixtures thereof;

(9) A is selected from the group consisting of O, an aliphatic ridge, an aryl

## THE REFERENCES OF RECORD

As evidence of obviousness, the examiner relies upon the following references.

|   |           |               |
|---|-----------|---------------|
| Riccitiello et al. (Riccitiello ('728)) | 4,767,728 | Aug. 30, 1988 |
| Niebylski                               | 5,045,399 | Sep. 3, 1991  |
| Riccitiello et al. (Riccitiello ('278)) | 5,130,278 | Jul. 14, 1992 |
| Zank et al. (Zank)                      | 5,256,753 | Oct. 26, 1993 |

## THE REJECTIONS

Claims 1 through 20 stand rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Riccitiello ('728) or ('278), Niebylski and Zank, (Answer, page 3) .

## OPINION

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with the appellants that the aforementioned rejections under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a) are not well founded. Accordingly, we do not sustain the examiner's rejections.

“[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability, ” whether on the grounds of anticipation or obviousness. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). In the case before us, the examiner relies upon four references, in the alternative, to reject the claimed subject matter and establish either anticipation or a *prima facie* case of

obviousness. The basic premise of the rejection is that each of the references teaches boron-carbon-silicon ceramic products produced from preceramic polymers, which products are patentably indistinguishable from the claimed subject matter. See the examiner's rejection of March 12, 1996, page 3. We disagree.

We find that Riccitiello ('728) discloses an organic silicon-boron ceramic material prepared by pyrolyzing polyorganoborosilanes at high temperatures. Ceramic materials are produced which have SiC, SiB<sub>4</sub>, SiB<sub>6</sub>, and B<sub>4</sub>C moieties which are the result of thermal degradation. See column 1, lines 15-20. See also column 4, lines 24-28. We further find that Riccitiello ('728) discloses repeating units having B-Si bonds present. See column 3, lines 11-18. It cannot be ascertained and the examiner has provided no evidence that B-Si bonds are present in the ceramic of the claimed subject matter. Moreover, we determine that there is little structural similarity between the ceramic prepolymer of Riccitiello ('728) prior to pyrolysis and the ceramic prepolymer of the claimed subject matter. Accordingly, no conclusions can be drawn as to the similarities of the final ceramic product obtained by patentee and that of the claimed subject matter.

Similarly, we find that Riccitiello ('278) discloses an organic-inorganic polymer comprising boron-carbon-silicon and the ceramic produced by pyrolysis of the polymer. See column 1, lines 20-24, and 35-38. We further find that patentee states, "[t]he reaction of borane and vinylsilane(s) gives various products depending on the starting material." See column 3, lines

**52-58, Table 1, and column 5, lines 24-51. Moreover, we determine that the ceramic prepolymer of the patentee and that of the claimed subject matter have little structural similarity. Based upon the above findings and determination, we conclude that patentee obtains different Si-C-B ceramics depending upon the initial polymer formed and the decomposition conditions utilized. Moreover, the evidence is persuasive that the Si-C-B ceramics differ substantially from each other depending on the starting materials and the process conditions of pyrolysis.**

**As for Niebylski and Zank, we find that Niebylski discloses nitrogen containing ceramic materials derived from polysilazanes. See column 1, line 12. The polymers protect surfaces from oxidative degradation and generally provide protective ceramic coatings on substrates. See column 3, lines 9-12, and 23-24. The preceramic polymers are coated on a substrate and pyrolyzed to convert the coating to a ceramic. See column 3, lines 49-55 and column 4, lines 11-16.**

**Zank is likewise directed to a nitrogen containing borazine modified polycarbosilane polymers and ceramic polymers derived therefrom. See Abstract. Different ceramic yields are obtained depending on the initial composition used. See Tables 1, 2 and 3. Based upon the above findings, we determine that each of the precursor polymers prior to formation of the ceramic contains nitrogen and have compositions substantially different from each other and**

that of the claimed subject matter. We further find that Zank, moreover, provide evidence that nitrogen forms a part of the ceramic following pyrolysis. See Tables 1, 2, and 3.

Based upon the above findings and analysis, we cannot agree with the examiner's threshold determination that the claimed subject matter appears to be substantially the same as the composition of the prior art. See Answer, page 4.

The patentability of a product claimed in a product-by-process claim is determined based on the product itself, not on the method of making it. See *In re Thorpe*, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985) (“If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.”). Whether a rejection is under 35 U.S.C. § 102 or § 103, when appellants’ product and that of the prior art appears to be identical or substantially identical, the burden shifts to appellants to provide evidence that the prior art product does not necessarily or inherently possess the relied-upon characteristics of appellants’ claimed product. See *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980); *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977); *In re Fessmann*, 489 F.2d 742, 745, 180 USPQ 324, 326 (CCPA 1974). The reason is that the Patent and Trademark Office is not able to manufacture and compare products. See *Best*, 562 F.2d at 1255, 195 USPQ at 434; *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).



**On the record before us, the products of both the claimed subject matter and the references of record are prepared by the same process, that of pyrolysis. The difference between them is in the composition of the starting materials of the prior art which differ from each other and from that of the claimed subject matter. The examiner assumes throughout the prosecution that following pyrolysis, each of the ceramic products will be the same or substantially the same. However, the examiner has not established that the polymers of the prior art form the same ceramic as, or one substantially the same as, the ceramic of the claimed subject matter. Accordingly, we do not sustain either the rejection under 35 U.S.C. § 102 or § 103(a) of the examiner.**

#### **DECISION**

**The rejections of claims 1 through 20 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative under 35 U.S.C. § 103(a) as obvious over Riccitiello ('728) or ('278), Niebylski and Zank are reversed.**

**The decision of the examiner is reversed.**

**REVERSED**

|                                    |   |                        |
|------------------------------------|---|------------------------|
| <b>Edward C. Kimlin</b>            | ) |                        |
| <b>Administrative Patent Judge</b> | ) |                        |
|                                    | ) |                        |
|                                    | ) |                        |
| <b>Thomas A. Waltz</b>             | ) | <b>BOARD OF PATENT</b> |
| <b>Administrative Patent Judge</b> | ) | <b>APPEALS AND</b>     |
|                                    | ) | <b>INTERFERENCES</b>   |
|                                    | ) |                        |
| <b>Paul Lieberman</b>              | ) |                        |
| <b>Administrative Patent Judge</b> | ) |                        |

**tdl**

**Associate Counsel (Patents)**  
**Code 3008.2**  
**Naval Research Laboratory**  
**Washington, DC 20375-5000**